

REMARKS/ARGUMENTS

The rejections presented in the Office Action dated May 18, 2007 (hereinafter Office Action) have been considered. Claims 1-58 remain pending in the application. Applicant acknowledges the allowability of claims 36-40. No claim has been amended, canceled, or added. Reconsideration of the pending claims and allowance of the application in view of the present response is respectfully requested.

Claims 1-2, 8-9, 11, 17-19, 22-23, 25-26, 27-30, 32 and 43-58 are rejected based on 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,674,518 to Salo (hereinafter "*Salo*").

To anticipate a claim, the reference must teach every element of the claim. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Therefore, all claim elements, and their limitations, must be found in the prior art reference to maintain a rejection based on 35 U.S.C. §102.

Salo discloses a cardiac monitoring apparatus for quantitatively measuring the instantaneous volume of blood contained within a given chamber of the heart whereby stroke volume and cardiac output can be continuously monitored. Respectfully, *Salo* does not anticipate Applicant's claimed subject matter.

In the Office Action, the Examiner contends that *Salo* discloses, with reference to Figure 2, amplification circuitry 36, 40; a first electrode arrangement coupled to the first amplifier input on a lead; a second electrode arrangement coupled to the second amplifier input on a lead; and a signal processor provided in the housing and coupled to the amplification circuitry, the signal processor configured to separate a source signal using a first composite signal detected at the first input impedance and a second composite signal detected at the second input impedance.

Respectfully, the Examiner's characterization of the *Salo* teachings is erroneous. The Examiner identifies amplification circuitry 36, 40 as corresponding to Applicant's

amplification circuitry recited in the claims. Each of isolation amplifiers 36 and 40, as shown in Figure 2 of *Salo*, has a single input coupled to a respective oscillator 34, 38. Neither amplifier 36, 40 is shown or described as having first and second amplifier inputs.

Assuming, *arguendo*, that the combination of amplifiers 36, 40 is construed as amplification circuitry, there is no teaching that this amplification circuitry (i.e., the combination of amplifiers 36, 40) has first and second input impedances that differ from one another, as is expressly recited in claims 1 and 51.

Moreover, claim 1, for example, recites that first and second electrode arrangements are respectively coupled to the first and second amplifier inputs. *Salo*'s amplifiers 36 and 40 have their inputs respectively coupled to oscillators 34 and 38, not electrodes.

The Examiner relies on column 7, lines 1-30 of *Salo* as purportedly corresponding to Applicant's claimed features of a signal processor provided in the housing and coupled to the amplification circuitry, the signal processor configured to separate a source signal using a first composite signal detected at the first input impedance and a second composite signal detected at the second input impedance.

Applicant's claims recite, in various forms, amplification circuitry having first and second input impedances. Respectfully, the impedances identified in *Salo* at column 7, lines 1-30 by the Examiner are described as impedances between sense electrodes, not input impedances associated with amplification circuitry. *Salo* does not appear to teach that its amplifiers are configured to have first and second input impedances and, in particular, first and second input impedances that differ.

Applicant's independent claims 1, 17, 32, and 51 recite, in various forms, separating a source signal using a first composite signal detected at the first input impedance and a second composite signal detected at the second input impedance. *Salo* does not teach signal separation as contemplated in Applicant's claim. Rather, *Salo* teaches that a computer is programmed to generate a single corrected instantaneous impedance for each pair of sense electrodes from two impedance values measured at two drive frequencies, convert this single value to a segment volume value for each ring electrode pair, and then sum the

volumes from each ring electrode pair to produce a total instantaneous ventricular volume. Column 7, lines 27-34.

One of ordinary skill in the art would readily appreciate that separating a source signal using multiple composite signals, as is contemplated in Applicant's claims, is discordant with *Salo*'s combining or summing of multiple signals or values produced therefrom.

The Examiner further contends that *Salo* discloses a switch 28 that corresponds to Applicant's switch recited in various forms in claims 17, 45, and 52. As is shown in Figure 2 and described at column 6, lines 5-40, switch 28 and switch 32 are respectively coupled to cables 26 and 30 that have wires that connect with electrodes 0 through N. The switches 28, 32 are rotary or push-button matrix switches configured such that any one of plural inputs may be connected to any of the outputs.

Contrary to the Examiner's contention, switches 28 and 32 are not configured to switch amplification circuitry between first and second input impedances. Rather, switches 28 and 32 are configured to allow manual selection of electrodes. Clearly, manually actuated switches 28 and 32 are not described as configured to switch between first and second input impedances at frequencies greater than about 100 Hz or 800 Hz, as is recited in claims 20 and 21, for example.

For at least these reasons, Applicant respectfully submits that *Salo* does not teach each and every element and limitation of independent claims 1, 17, 32, and 51, and therefore fails to anticipate these claims.

Dependent claims 2, 8-9, 11, 18-19, 22-23, 25-26, 27-30, 43-50, and 52-58 were also rejected based on 35 U.S.C. §102(b) as being anticipated by *Salo*. While Applicant does not acquiesce to the particular rejections to these dependent claims, it is believed that these rejections are now moot in view of the remarks made in connection with independent claims 1, 17, 32, and 51. These dependent claims include all of the limitations of the base claim and any intervening claims, and recite additional features which further distinguish

these claims from the cited reference. Therefore, dependent claims 2, 8-9, 11, 18-19, 22-23, 25-26, 27-30, 43-50, and 52-58 are also not anticipated by *Salo*.

For at least these reasons, Applicant respectfully submits that the rejection of claims 1-2, 8-9, 11, 17-19, 22-23, 25-26, 27-30, 32 and 43-58 as being anticipated by *Salo* is not sustainable.

Claims 1, 32, 35, 41 and 51 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,058,583 to Geddes (hereinafter “*Geddes*”).

Geddes discloses a system for measuring stroke volume of a patient’s heart. An impedance processor 18 is used to measure the voltage appearing across a selected one of several monopolar electrodes and the device case, which voltage is primarily a function of the impedance of the blood in the ventricle. Column 6, lines 47-58.

Geddes further discloses that the impedance processor 18 includes individual buffer amplifiers 35, 37 and 39, as shown in Figure 4, connected respectively to conductors 25, 27 and 29. Each buffer amplifier delivers a voltage proportional to that appearing between its associated monopolar electrode and case 36 to a signal processing circuit 40. Circuitry is provided within processing circuit 40 to obtain a weighted sum of the buffered impedance signals. Column 6, line 59—Column 7, line 15.

Geddes teaches summing of buffered impedance signals. Changes in the amplitude of the summed signal represent changes in ventricular blood impedance. Column 7, lines 16-17.

Applicant’s independent claims 1, 32, and 51 recite, in various form, separating a source signal using a first composite signal detected at the first input impedance and a second composite signal detected at the second input impedance. *Geddes* fails to teach signal separation as contemplated in Applicant’s claim. Rather, *Geddes* teaches summing of impedance signals.

On page 4 of the Office Action, it is stated that the “Examiner considers the weighted sum of the impedance signals as described by *Geddes* to be separating a source signal.” Applicant respectfully asserts that this interpretation is erroneous, for at least the

reason that summing of signals to produce a weighted sum combines, rather than separates signals.

Applicant respectfully submits that the Examiner's contention that "summing" of impedance signals as described by *Geddes* corresponds to Applicant's recitation of "separating a source signal" is not supported by *Geddes* and constituted erroneous speculation. Applicant respectfully requests that, should the Examiner not withdraw the rejection of claims 1, 32, and 51 as anticipated by *Geddes*, the Examiner provide demonstrable evidence to support the contention that producing a weighted sum of impedance signals as described by *Geddes* is technically the same as "separating a source signal."

Dependent claims 35 and 41 were also rejected based on 35 U.S.C. §102(b) as being anticipated by *Geddes*. While Applicant does not acquiesce to the particular rejections to these dependent claims, it is believed that these rejections are now moot in view of the remarks made in connection with independent claim 32. These dependent claims include all of the limitations of the base claim and any intervening claims, and recite additional features which further distinguish these claims from the cited reference. Therefore, dependent claims 35 and 41 are also not anticipated by *Geddes*.

For at least these reasons, Applicant respectfully submits that the rejection of claims 1, 32, 35, 41 and 51 as being anticipated by *Geddes* is not sustainable.

Claims 4, 20, 21, 24, 33, 34 and 42 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Saló* as applied to claims 1, 17, 32 and 51. Claim 6 is rejected under 35 U.S.C. §103(a) as being unpatentable over *Saló* as applied to claim 5. Claims 7 and 27 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Saló* as applied to claims 1 and 17, and further in view of U.S. Patent No. 6,684,101 to Daum (hereinafter "*Daum*"). Claims 10 and 31 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Saló* as applied to claims 1 and 17. Claims 12-16 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Geddes* as applied to claim 1, and further in view of U.S. Patent No. 5,117,824 to Keimel et al. (hereinafter "*Keimel*").

Each of claims 4, 6, 7, 10, 12-16, 20, 21, 24, 27, 31, 33, 34, and 42 depend from one of independent claims 1, 17, and 32, respectively. Independent claims 1, 17, and 32 are not obvious for at least the reason that the cited references fail to teach or suggest each and every limitation recited in each claim. Furthermore, while Applicant does not acquiesce to the particular rejections to these dependent claims, it is believed that these rejections are now moot in view of the remarks made in connection with independent claims 1, 17, and 32. These dependent claims include all of the limitations of the base claim and any intervening claims, and recite additional features which further distinguish these claims from the cited reference. Moreover, if an independent claim is nonobvious under 35 U.S.C. §103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Therefore, dependent claims 4, 6, 7, 10, 12-16, 20, 21, 24, 27, 31, 33, 34, and 42 are not made obvious by any combination of *Salo*, *Geddes*, *Daum*, or *Keimel*.

For at least these reasons, the Applicant respectfully submits that the rejection of claims 4, 6, 7, 10, 12-16, 20, 21, 24, 27, 31, 33, 34, and 42 as being made obvious by any combination of *Salo*, *Geddes*, *Daum*, or *Keimel* is not sustainable. As such, Applicant respectfully requests withdrawal of the §103(a) rejection of claims 4, 6, 7, 10, 12-16, 20, 21, 24, 27, 31, 33, 34, and 42 and notification that these claims are in condition for allowance.

It is to be understood that Applicant does not acquiesce to the Examiner's characterization of the asserted art or Applicant's claimed subject matter, nor of the Examiner's application of the asserted art or combinations thereof to Applicant's claimed subject matter. Moreover, Applicant does not acquiesce to any explicit or implicit statements or conclusions by the Examiner concerning what would have been obvious to one of ordinary skill in the art. Applicant respectfully submits that a detailed discussion of each of the Examiner's rejections beyond that provided above is not necessary, in view of the clear absence of teaching and suggestion of various features recited in Applicant's pending. Applicant, however, reserves the right to address in detail the Examiner's characterizations, conclusions, and rejections in future prosecution.

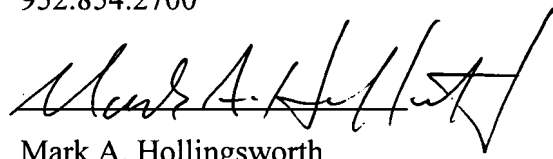
Authorization is given to charge Deposit Account No. 50-3581 (GUID.607PA) any necessary fees for this filing. If the Examiner believes it necessary or helpful, the Examiner is invited to contact the undersigned attorney to discuss any issues related to this case.

Respectfully submitted,

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